Title: Two-Digit Addition at the Zoo

Brief Overview:

During the course of the week, students will use manipulatives as well as the standard algorithm to determine the sum of two-digit whole numbers with regrouping. The students will begin the week using manipulatives; as the week progresses the students will use the standard algorithm to solve word problems.

NCTM Content Standard/National Science Education Standard:

- Model situations that involve the addition of whole numbers using objects pictures and symbols.
- Develop and use strategies for whole number computations with a focus on addition.
- Develop fluency with basic number combinations for addition.

Grade/Level:

Second Grade

Duration/Length:

Three days, 75 minute lessons, including a pre and post assessment

Student Outcomes:

Students will:

- Review number relations in order to determine the sum of two digit basic whole numbers without regrouping.
- Use base ten blocks and place value work mats in order to determine the sum of two digit basic whole numbers.
- Apply addition with regrouping in order to determine the sum of two digit basic whole numbers.

Materials and Resources:

Day 1

- Student Resource 1
- *My Visit to the Zoo* by Aliki
- Student resource sheet 2
- Teacher transparency of student resource sheet 2
- Base ten blocks
- Connecting cubes
- Student Resource 3

- Student Resource 4 (reteach, not for whole class)
- Student Resource 5 (enrich, not for whole class)
- Student Resource 6
- Teacher Resource 1
- Teacher Resource 2

Day 2

- Deck of cards
- Student Resource 7
- Student Resource 8
- Student Resource 9
- Student Resource 10
- Dice
- Transparency of Student Resource 7
- Colored Transparency Markers
- Teacher Resource 3
- Base Ten Blocks

Day 3

- Student Resource 11
- Teacher Resource 4
- BINGO Chips
- Student Resource 12
- Teacher Resource 5
- Student Resource 13
- Teacher Resource 6
- Base Ten Blocks
- Highlighter

Development/Procedures:

Day 1

- Pre-assessment
  Student Resource 1 Distribute to students. Allow time for students to complete.

- Engagement
  Engage students in a discussion about the Zoo. Ask questions such as: Have you ever been to the zoo? What is your favorite animal at the zoo? What does the zoo smell like? What is your least favorite animal at the zoo? Other than animals what would you see at the zoo? When could you use math when you are at the zoo?

Read Aloud: *My Visit to the Zoo* by Aliki

- Exploration
  - Tell the students we are going to visit the zoo during this math unit. Tell the student they will be learning about animals while they are learning math.
  - Pass out a ticket for the zoo to each student. (see Teacher Resource 2)
  - Put students into pairs. Tell the students they need to add the number of tickets to find out how many free tickets they have altogether. Tell students they will be able to use base ten blocks, connecting cubes, and a place value mat to solve their problem. (Student Resource 2)
  - Walk around classroom to see how students are solving the two-digit addition problem with regouping. Ask students questions such as: How did you know to exchange ten ones for one ten? Why did you choose the strategy you did? How is this problem different from other addition problems we have learned how to solve? Can you have 10 or more ones in the ones place? If students have solved their problem correctly one way, ask them to solve it another way, using a different strategy.

- Explanation
  - Bring the group back together to discuss possible solutions to the problem. Ask students to share how they solved their problems.
  - Model how to solve 2 more two-digit addition problems with regrouping, using the base ten blocks and the place value mat. (make transparency of Student Resource 2)
  - Example:

    45
    + 26

  - Place 4 tens and 5 ones on the place value work mat.
  - Under the 4 tens and 5 ones, teacher will place 2 tens and 6 ones.
  - Tell student that we know 5+6=11.
  - Ask students, Can we put the sum of 11 in the ones place?
  - Students will respond.
  - Model exchanging ten ones for one ten.
  - Remove ten ones and replace with one ten.
  - Explain the exchange of place value blocks is called regrouping.
  - Count the total blocks in the tens and ones place to find the sum.

  - Model problems with the example above until the majority of students feel comfortable using base ten blocks to solve two digit

addition problems with regrouping. Differentiate based on observations during this part of the lesson.

- Application

  Have students work independently to complete Student Resource 3.

- Differentiation
  - Reteach: Student Resource 4
    Practice the regrouping strategy with students using the base ten blocks. Once students have mastered the concept, using the base ten blocks distruibute Student Resource 4.

  - Enrich: Have students work independently to complete Student Resource 5.

- Assessment: Have students work independently to complete Student Resource 6.

Day 2

- Engagement
  - Distribute a stack of playing cards to each group of 4 students.
  - Tell students to flip over 4 cards to create a two-digit addition problem.
  - Tell students to determine if the problem requires regrouping.
  - Tell students to continue this process for 5 minutes.

- Exploration
  - Tell students to each flip over 4 cards and create a two-digit addition problem.
  - Tell students to record their two-digit addition problem in Student Resource 7, students will complete independently.
  - Tell students to try and solve their problem using the standard algorithm.
  - Walk around to observe who is using the algorithm correctly.

- Explanation
  - Model solving two-digit addition problems with regrouping using the standard algorithm.
  - Use a transparency of Student Resource 7.
  - Record these steps on the board.

$$\begin{array}{r} 1. \quad 54 \\ +\ 28 \\ \hline \end{array}$$

2. 54
+28
2 12

1

3. 54
+28
82

- Application
  - Have students work in pairs.
  - Distribute a transparency of Student Resource 7, Student Resource 8, two different colored transparency markers and a pair of dice to each student.
  - Tell student 1 to roll dice to create a two digit number.
  - Tel student 1 to record the number on the transparency.
  - Tell student 2 to roll dice to create another two digit number.
  - Tell student 2 to record on the transparency.
  - Tell students to solve the two digit addition problem using the standard algorithm.
  - Continue playing until students are comfortable using the strategy.

- Differentiation
  - Reteach
    - Model two digit addition with regrouping using base ten blocks. Record the two digit addition problem and model the standard algorithm.
    - Continue this process until students feel comfortable recording the algorithm.
    - Play a modified version of How High Can You Go? with the group.
    - Distribute student Resource 9. Eliminate steps 6, 7, and 8.

  - Enrich
    - Divide class into pairs.
    - Distribute a transparency of Student Resource 7, Student Resource 9, two dice, and two colored transparency markers to each student.
    - Tell students to roll dice to create 2 two digit numbers.
    - Tell students to add their numbers in a transparency of Student Resource 7.

- Tell students to compare their numbers to see who is closest to 100.
- Record whose sum is closest to 100 on Student Resource 9.

- Assessment

  Have students work independently to complete Student Resource 10

Day 3

- Engagement
  - Play Zoo BINGO
  - Distribute Student Resource 11 to pairs of students. (more than one pair will have the same BINGO card, multiple pairs can win BINGO at the same time)
  - Use Teacher Resource 4 to call number's.

- Exploration
  - Cut apart Student Resource 12. Place all pieces into individual bags for students. Do this prior to the activity.
  - Distribute a bag of Student Resource 12 to each pair.
  - Tell students to sort cards into the correct category.

- Explanation
  - Present the following steps to the students.
    1. Read the problem
    2. Circle any important numbers in the problem
    3. Highlight the question
    4. Decide which operation you will use
    5. Write number sentence
    6. Solve the problem
    7. Check your work
  - Model the seven steps with three different word problems.

- Application
  - Tell students to solve the problems from the exploration activity, Student Resource 12.
  - Tell students to follow the seven step process to solve these problems.

- Differentiation
  - Reteach
    - Model the 7 step process with Student Resource 12.
    - Tell students to draw a picture of the word problem in addition to the 7 steps.
    - If students are below expectations go back to using base ten models.
  - Enrich
    - Tell students to create their own word problems in pairs. Tell students to switch problems with their partner and solve.

Summative Assessment:

Have students work independently to complete Student Resource 13.

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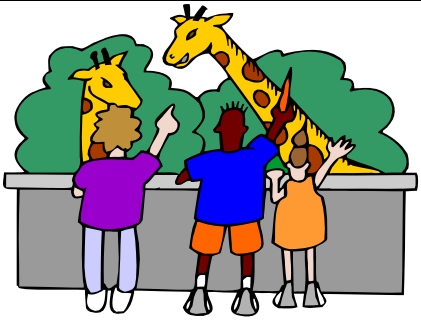
Name_____Date_____

Pre-Assessment

Two Digit Addition with Regrouping



1. 23
+ 16

2. 67
+ 23

3. The second grade at Elmwood Elementary School went on a field trip to the zoo. Ms.Smith bought 27 tickets for her class. Ms. Jones bought 32 tickets for her class. How many tickets did Ms. Smith and Ms. Jones buy in all?

Explain how you solved the problem.

_____

_____

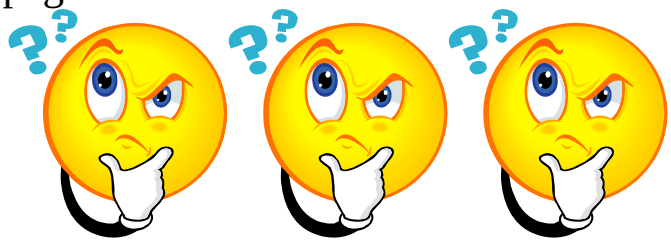
***Did you know? Giraffe's can be 19 feet tall and can weigh 3, 000 pounds. A giraffe can live to be 25 years old.**

*** Did you know? Monkeys don't eat the peels of their bananas. Monkeys don't catch colds. A group of monkeys is called a troop.**

Tens	Ones

Name_____Date_____

Directions: Use your base ten blocks and your place value mat in order to solve the following 2 digit addition problems. As you solve the problems you will match the letter to the sum at the bottom of the page to learn more about a fun zoo animal!

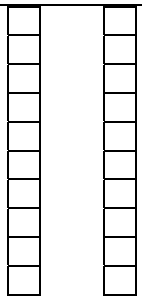
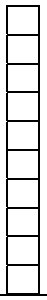
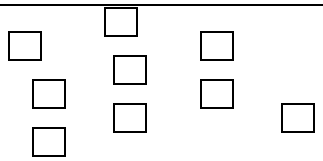


1. 23 + 47 **A**	2. 19 + 13 **E**	3. 34 +16 **E**
4. 15 + 15 **T**	5. 52 + 19 **P**	6. 54 +18 **R**
7. 68 +19 **N**	8. 24 +29 **H**	9. 18 +42 **L**

This animal has large ears, but its hearing is poor. This animal walks about four miles per hour. This animal spends 16 hours a day eating.

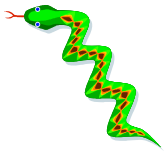
___	___	___	___	___	___	___	___
32	**60**	**50**	**71**	**53**	**70**	**87**	**30**

*Did you know this zoo animal can see really well at night? This zoo animal weighs 55-88 pounds when they are born. They can run at speeds of up to 35 miles per hour.

Tens	Ones
	
	

21
+19

Circle your sum to find the answer to the clue.



30

24

40

57

Name_____Date_____

Directions: Use your base ten blocks and your place value mat in order to solve the following, missing digit in the 2 digit addition problems. As you solve the problems you will match the letter to the sum at the bottom of the page to learn more about a fun zoo animal!

2. 2 3
+ 4 ___ **A**
70

2. 19
+ 1 ___ **E**
32

3. 34
+1 ___ **E**
50

5. 15
+ 1 ___ **T**
30

5. 52
+ 1 ___ **P**
71

6. 54
+1 ___ **R**
72

8. 69
+1 ___ **N**
87

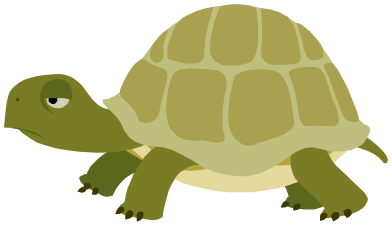
8. 29
+2 ___ **H**
53

9. 18
+4 ___ **L**
60

This animal has large ears, but its hearing is poor. This animal walks about four miles per hour. This animal spends 16 hours a day eating.

___	___	___	___	___	___	___	___
3	**2**	**6**	**9**	**4**	**7**	**8**	**5**

Name_____Date_____



Directions: Use your base ten blocks in order to solve the following 2 digit addition problems with regrouping.

1. 25
+16

2. 19
+23

3. 13
+17

4. 29
+54

*Did you know that turtles have been on earth for more than 200 years? They evolved before mammals, birds, crocodiles, snakes, and even lizards!

***The lion is the second largest cat in the world. Female lions do most of the hunting. A lion's roar can be heard can be heard up to 5 miles away.**

Tens	Ones
+	

Name _____ Date _____

Roll to Win!

Tens	Ones
□ +	

Tens	Ones
□ +	

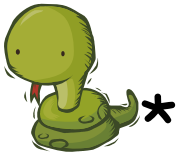
Tens	Ones
□ +	

Tens	Ones
□ +	

Tens	Ones
□ +	

Tens	Ones
□ +	

How High Can You Go?



* Snake scales are made of the same thing our finger nails are made of.

Directions:

1. **Give each pair one transparency of Student Resource 7.**
2. **Give each pair 4 dice.**
3. **Give each pair two different colored transparency markers.**
4. **Each student will roll the 4 dice to create a 2 digit addition problem.**
5. **Students will record their 2 digit addition problem on the transparency. (Student Resource 7)**
6. **Students will compare the sums of their 2 digit addition problems in order to see whose sum is closer to 100.**
7. **The student who is closer to 100 will receive a point on the score sheet below.**
8. **The student who has the most points at the end of the game is the winner.**

Player 1 _____	Player 2 _____

Name_____Date_____

Directions: Use the standard algorithm in order to solve the two digit addition problems. Record on the line whether or not you needed to regroup.

☐

56
+17 Did you need to regroup? _____
(yes or no)

☐

23
+42 Did you need to regroup? _____
(yes or no)

☐

57
+34 Did you need to regroup? _____
(yes or no)

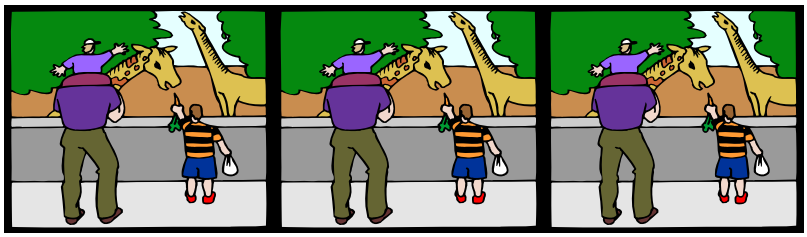
How do you know?

_____
_____
_____

*Sometimes pandas sleep in trees. Pandas often tumble and roll in a somersault.

Zoo Bingo

23 + 44	56 +39	14 +79
10 +10	54 +33	62 +18
19 +20	89 + 9	35 + 17

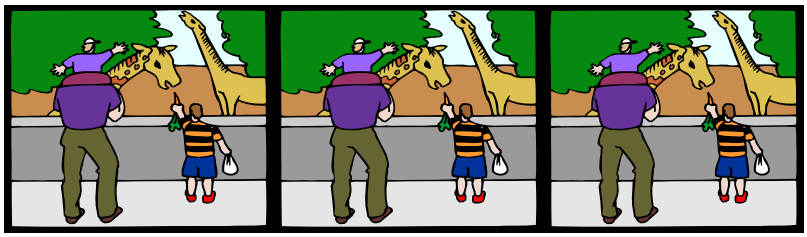


Share your fact!

Penguins are birds who are no longer able to fly, but are great swimmers and divers instead. Their wings have morphed into flippers and their torpedo-shapes body allows them to swim under water at high speeds. This also causes them to waddle on land.

Zoo Bingo

35 + 17	89 + 9	19 +20
10 +10	54 +33	62 +18
14 +79	56 +39	23 + 44

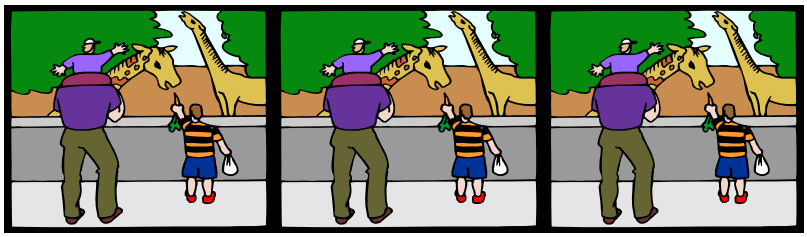


Share your fact!

Tigers are the largest naturally occurring specie of cats.

Zoo Bingo

23 + 44	56 +39	14 +79
10 +10	89 + 9	35 +17
54 +33	89 + 9	62 + 18

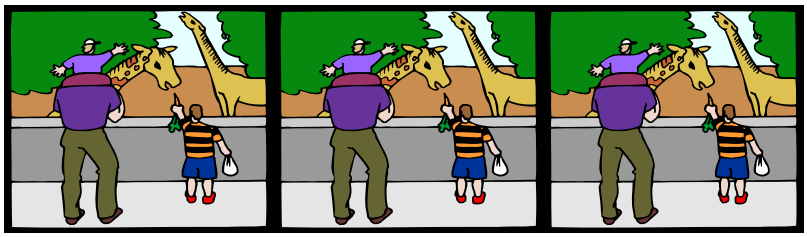


Share your fact!

Male seals are darker in color while females are lighter.

Zoo Bingo

23 + 44	56 +39	14 +79
10 +10	89 + 9	35 +17
54 +33	89 + 9	62 + 18

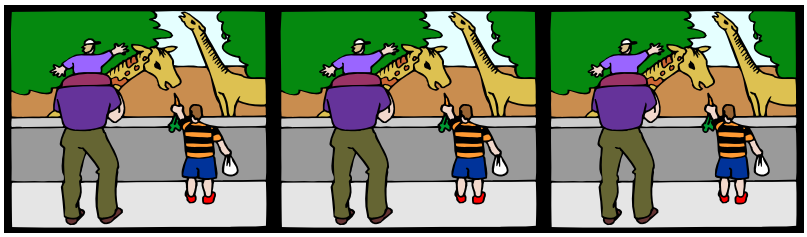


Share your fact!

A rhinoceros can sleep either standing or lying down.

Zoo Bingo

89 + 9	35 +17	14 +79
10 +10	89 + 9	56 +39
54 +33	23 +44	62 + 18

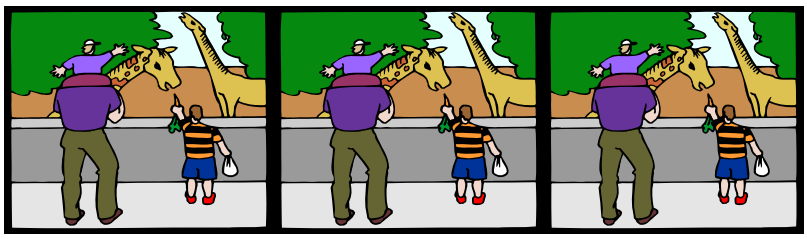


Share your fact!

Female polar bears would rather build their dens in "old snow" from previous years rather than the freshly fallen snow.

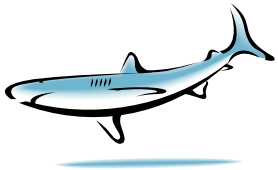
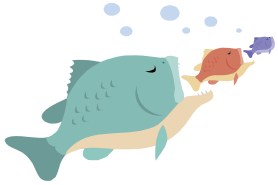
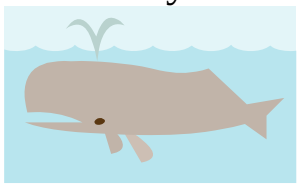
Zoo Bingo

23 + 44	56 +39	54 +33
62 +18	89 + 9	35 +17
14 +79	89 + 9	10 + 10



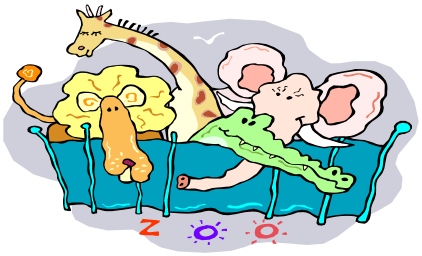
Share your fact!

The flamingo's pink or reddish color comes from the algae, diatoms, and small crustaceans the birds eat.

Need to Regroup	Do Not Need to Regroup
	
Tom went to the Zoo to look at the fish. He counted 25 red fish and 48 purple fish. How many fish did he see in all? 	Susan wanted to feed the seals when she went to the Zoo. The Zoo Keeper gave her 34 small fish and 12 large fish. How many fish did she have to feed the seals? 
Ms. Mallard's and Ms. O'Neal's classes went to the Zoo. Ms. Mallard bought 24 tickets. Ms. O'Neal bought 18 tickets. How many tickets did the teachers buy? 	Jordan has 14 tickets. She needs 15 more to buy popcorn and a soda. How many tickets does she need to buy her snack? 
Ryan and John like to watch the dolphins jump. They each watched for 2 hours. Ryan counted 23 jumps. John counted 16 jumps. How many jumps did the brothers count together? 	Robin walked 13 miles around the zoo. Caroline walked 14 miles around the zoo. How many miles did they walk together? 

Name _____ Date_____

Post Assessment
Two Digit Addition with Regrouping



1. Draw the base ten blocks to solve the following problem.

43
+28

Tens	Ones

2. $\square$
56
$+27$

Write the steps you used to solve the following problem.

_____
_____
_____
_____

3. $\square$
34
$+43$

Write the steps you used to solve the following problem.

_____
_____
_____
_____

4. George and Harry counted the animals they saw at the zoo. George counted 43 animals and Harry counted 26 animals. How many animals did they count together?

5. Sally walked around the zoo for 36 minutes. Her friend Margie walked around the zoo for 29 minutes. How many minutes did both of the girls spend walking around the zoo?

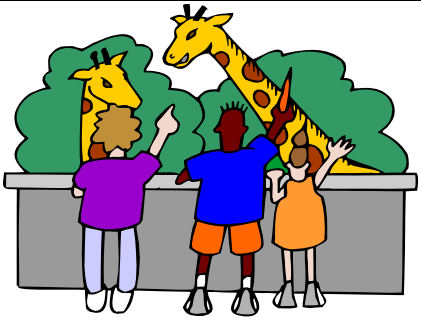
Fun Animal Facts

- **Giraffe's give birth standing up. That's 6 feet the baby has to drop.**
- **Kangaroo's are the best jumpers of all mammals. They can jump over 30 feet in one hop.**
- **The anaconda is the longest snake in the world.**
- **No two zebra's look alike. Each has a different stripe pattern.**
- **Anteaters can eat up to 30,000 insects in one day.**
- **Penguins eat snow as a source of fresh water.**

Name_____Date_____

Pre-Assessment

Two Digit Addition with Regrouping



2. 23
+ 16
39

2. 67
+ 23
90

3. The second grade at Elmwood Elementary School went on a field trip to the zoo. Ms.Smith bought 27 tickets for her class. Ms. Jones bought 32 tickets for her class. How many tickets did Ms. Smith and Ms. Jones buy in all?

Explain how you solved the problem.

Answers will vary. Students can draw pictures and/or words to explain there answer. Some answers can include the steps they used to solve the algorithm or a picture with base ten blocks.

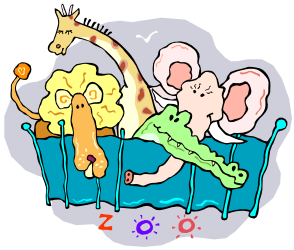
*Did you know? Giraffe's can be 19 feet tall and can weigh 3, 000 pounds. A giraffe can live to be 25 years old.

***Teacher note:** Teacher's will need to fill in a different number on each ticket. The number of free tickets should be a two digit number between 10 and 20. Teachers will want to make the two digit numbers large enough so that students will need to regroup. The teacher will also need to fill in the zoo name. (How the teacher decides on the zoo name is optional.)

_____ free tickets to the:

_____

Zoo!



Name_____Date_____

Directions: Use the standard algorithm in order to solve the two digit addition problems. Record on the line whether or not you needed to regroup.

```
  1
 56
+17
 73
```

Did you need to regroup? ___yes___ (yes or no)

```
   
 23
+42
 65
```

Did you need to regroup? ___no__ (yes or no)

```
  1
 57
+34
 91
```

Did you need to regroup? ___yes___ (yes or no)

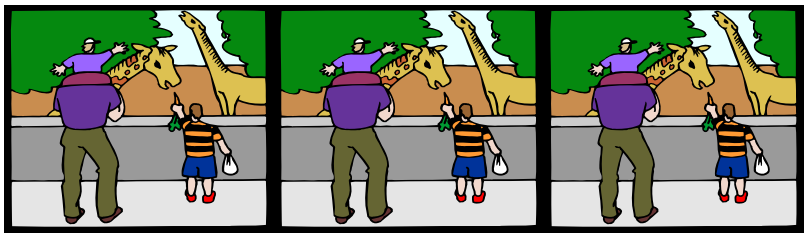
How do you know?

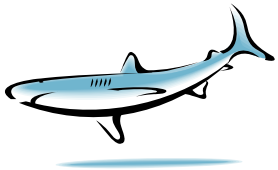
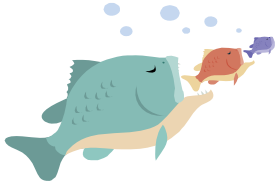
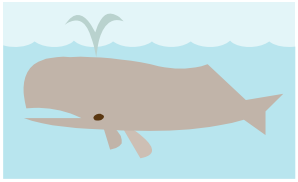
Students should explain the steps they used to solve the problem. Answers will vary.

*Sometimes pandas sleep in trees. Pandas often tumble and roll in a somersault.

Zoo Bingo
Calling Card

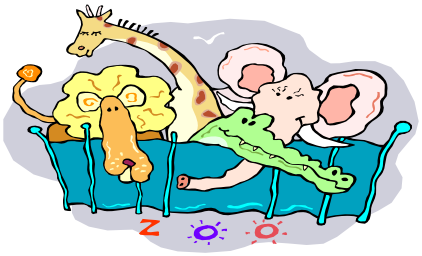
67	95	93
20	87	80
39	98	52



Need to Regroup 	Do Not Need to Regroup 
Tom went to the Zoo to look at the fish. He counted 25 red fish and 48 purple fish. How many fish did he see in all? 	Susan wanted to feed the seals when she went to the Zoo. The Zoo Keeper gave her 34 small fish and 12 large fish. How many fish did she have to feed the seals? 
Ms. Mallard's and Ms. O'Neal's classes went to the Zoo. Ms. Mallard bought 24 tickets. Ms. O'Neal bought 18 tickets. How many tickets did the teachers buy? 	Jordan has 14 tickets. She needs 15 more to buy popcorn and a soda. How many tickets does she need to buy her snack? 
Ryan and John like to watch the dolphins jump. They each watched for 2 hours. Ryan counted 23 jumps. John counted 16 jumps. How many jumps did the brothers count together? 	Robin walked 13 miles around the zoo. Caroline walked 14 miles around the zoo. How many miles did they walk together? 

Name _____ Date_____

Post Assessment
Two Digit Addition with Regrouping



2. Draw the base ten blocks to solve the following problem.

13
+28

Tens	Ones
Students will show the exchange of ten ones for one ten using base ten models.	

2. $\boxed{1}$
56
+27
83

Write the steps you used to solve the following problem.

1. 54
+ 28

2. 54
+ 28
3 12

3. $\boxed{1}$
54
+ 28
8 2

Answers will vary. Students should show understanding of this model with words, pictures and/or numbers.

3. $\square$
34
+43

See Answer Above

6. George and Harry counted the animals they saw at the zoo. George counted 43 animals and Harry counted 26 animals. How many animals did they count together?

$$\begin{array}{r} 43 \\ +26 \\ \hline 69 \end{array}$$

7. Sally walked around the zoo for 36 minutes. Her friend Margie walked around the zoo for 29 minutes. How many minutes did both of the girls spend walking around the zoo?

$$\begin{array}{r} \boxed{1} \\ 36 \\ +\ 29 \\ \hline 65 \end{array}$$

Fun Animal Facts

- **Giraffe's give birth standing up. That's 6 feet the baby has to drop.**
- **Kangaroo's are the best jumpers of all mammals. They can jump over 30 feet in one hop.**
- **The anaconda is the longest snake in the world.**
- **No two zebra's look alike. Each has a different stripe pattern.**
- **Anteaters can eat up to 30,000 insects in one day.**
- **Penguins eat snow as a source of fresh water.**